

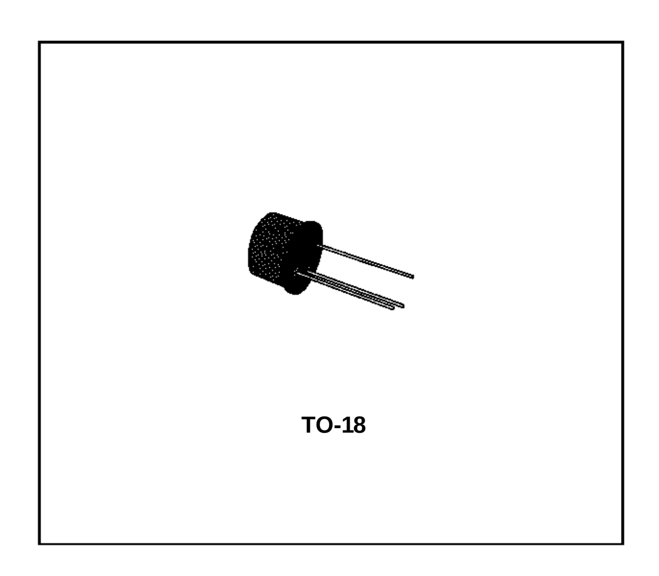

# BC394

## HIGH VOLTAGE AMPLIFIER

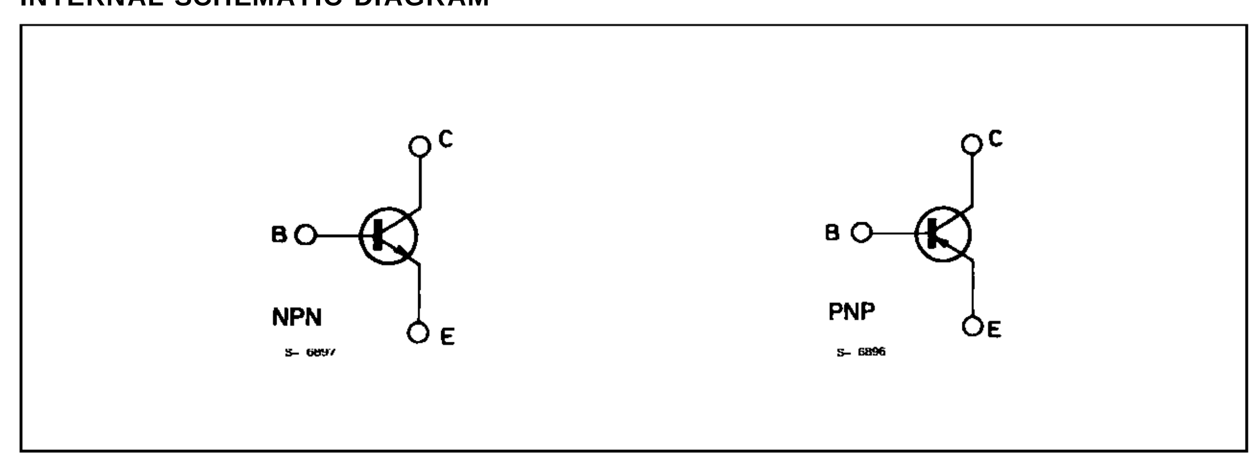
### DESCRIPTION

The BC394 is a silicon planar epitaxial NPN transistor in Jedec TO-18 metal case, designed for general purpose high-voltage and video amplifier applications.

The complementary PNP type is the BC393.




### INTERNAL SCHEMATIC DIAGRAM




### ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CBO}$ | Collector-base Voltage ($I_E$ = 0) | 180 | V |
| $V_{CEO}$ | Collector-emitter Voltage ($I_B$ = 0) | 180 | V |
| $V_{EBO}$ | Emitter-base Voltage ($I_C$ = 0) | 6 | V |
| $I_C$ | Collector Current | 100 | mA |
| $P_{tot}$ | Total Power Dissipation at $T_{amb} \leq 25$ °C<br>at $T_{case} \leq 25$ °C | 0.4<br>1.4 | W<br>W |
| $T_{stg}$ | Storage Temperature | – 55 to 200 | °C |
| $T_j$ | Junction Temperature | 200 | °C |

## THERMAL DATA

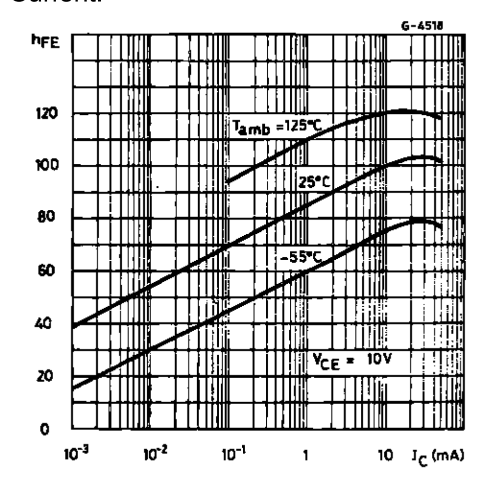
| | | | | |
|---|---|---|---|---|
| $R_{th\ j\text{-}case}$ | Thermal Resistance Junction-case | Max | 125 | °C/W |
| $R_{th\ j\text{-}amb}$ | Thermal Resistance Junction-ambient | Max | 440 | °C/W |

## ELECTRICAL CHARACTERISTICS ($T_{amb}$ = 25 °C unless otherwise specified)

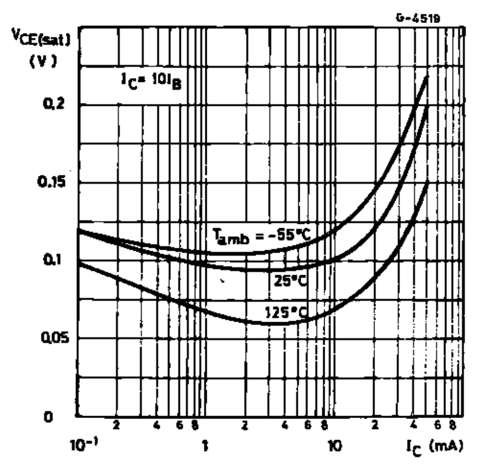
| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_{CBO}$ | Collector Cutoff Current ($I_E$ = 0) | $V_{CB}$ = 100 V<br>$V_{CB}$ = 100 V  $T_{amb}$ = 150 °C | | | 50<br>50 | nA<br>µA |
| $V_{(BR)\ CBO}$ | Collector-base Breakdown Voltage ($I_E$ = 0) | $I_C$ = 100 µA | 180 | | | V |
| $V_{(BR)\ CEO}$* | Collector-emitter Breakdown Voltage ($I_B$ = 0) | $I_C$ = 10 mA | 180 | | | V |
| $V_{(BR)\ EBO}$ | Emitter-base Breakdown Voltage ($I_C$ = 0) | $I_E$ = 100 µA | 6 | | | V |
| $V_{CE\ (sat)}$* | Collector-emitter Saturation Voltage | $I_C$ = 10 mA  $I_B$ = 1 mA<br>$I_C$ = 50 mA  $I_B$ = 5 mA | | 200<br>400 | 300 | mV<br>mV |
| $V_{BE\ (sat)}$* | Base-emitter Saturation Voltage | $I_C$ = 10 mA  $I_B$ = 1 mA<br>$I_C$ = 50 mA  $I_B$ = 5 mA | | 750<br>850 | 900 | mV<br>mV |
| $h_{FE}$ * | DC Curent Gain | $I_C$ = 1 mA  $V_{CE}$ = 10 V<br>$I_C$ = 10 mA  $V_{CE}$ = 10 V | <br>30 | 85<br>100 | | |
| $f_T$ | Transition frequency | $I_C$ = 10 mA  $V_{CE}$ = 10 V | 50 | 95 | | MHz |
| $C_{CBO}$ | Collector-base Capacitance | $I_E$ = 0  $V_{CB}$ = 10 V<br>f = 1 MHz | | 5 | | pF |

* Pulsed : pulse duration = 300 µs, duty cycle = 1 %.

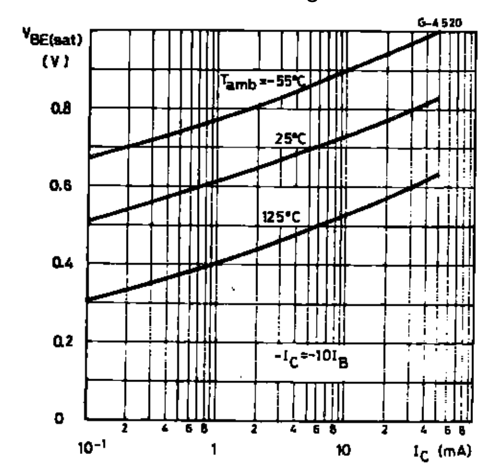
DC Current.



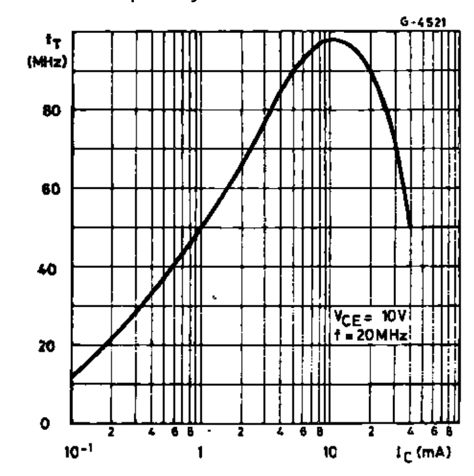

Collector-emitter Saturation Voltage.



Base-emitter Saturation Voltage.

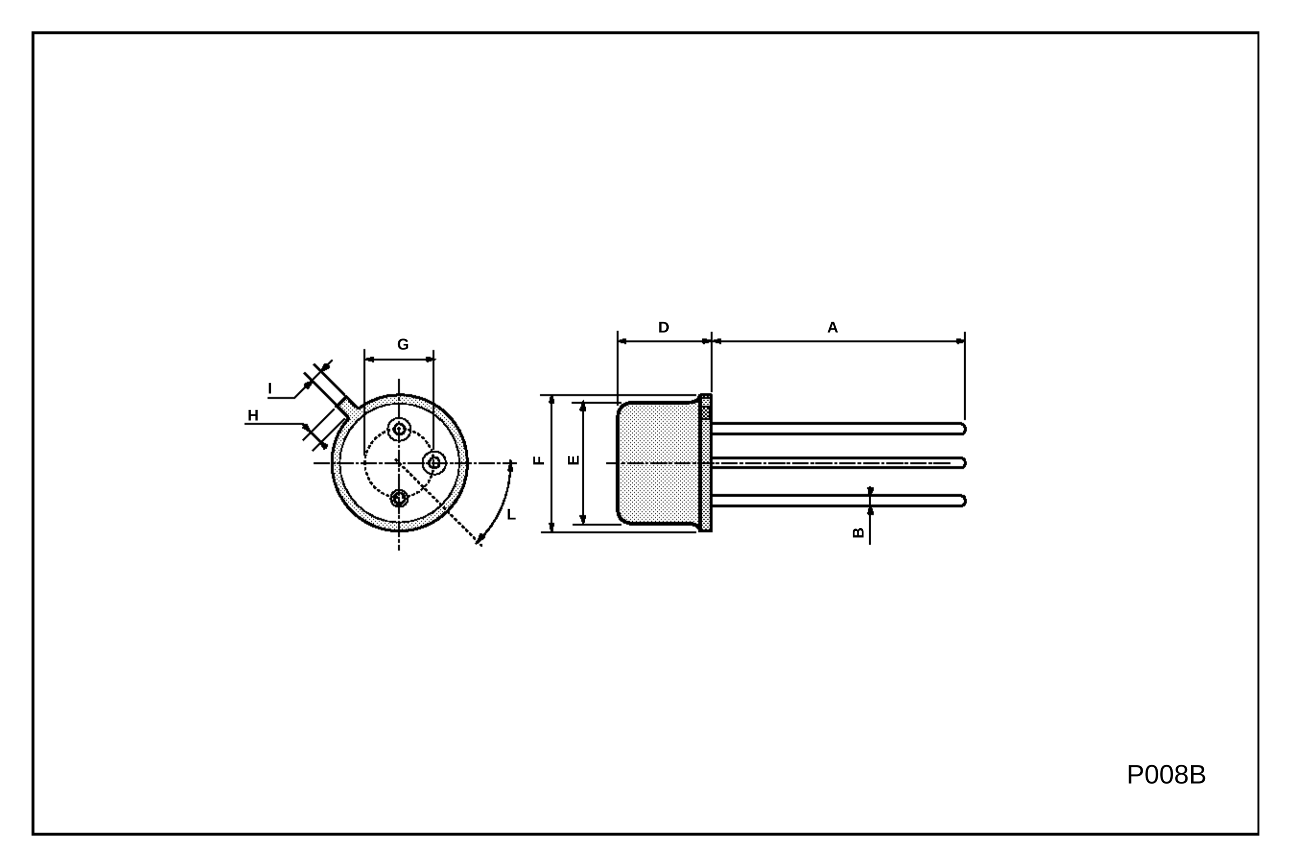



Transition Frequency.



# TO39 MECHANICAL DATA

| DIM. | mm | | | inch | | |
|---|---|---|---|---|---|---|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 12.7 | | | 0.500 | | |
| B | | | 0.49 | | | 0.019 |
| D | | | 6.6 | | | 0.260 |
| E | | | 8.5 | | | 0.334 |
| F | | | 9.4 | | | 0.370 |
| G | 5.08 | | | 0.200 | | |
| H | | | 1.2 | | | 0.047 |
| I | | | 0.9 | | | 0.035 |
| L | 45$^{o}$ (typ.) | | | | | |



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